Melvin Butte Vegetation Management Project

Environmental Assessment

Heritage Report

Matt Mawhirter

District Archaeologist

1/4/2016

Cultural Resources

All known cultural resources located within the area of potential effect (APE) will be flagged for avoidance with a 30 meter buffer prior to commencement of the project.

If previously unknown items of prehistoric or historical value are discovered or disturbed during project work, activities will cease in the area affected and the District Archaeologist will be notified. A mitigation plan would be developed in order to address the effects of the project on the resource.

Existing Condition

A review of the proposed work and known archaeological sites was conducted, along with a literature review to determine the possible presence of unknown cultural sites. The Deschutes National Forest high probability model was used to help establish survey areas within the APE. One hundred percent of the identified high probability areas have been surveyed while forty percent of identified low probability areas have been surveyed. The low probability areas surveyed were chosen as a representative sample of all low probability areas within the APE.

Seventeen previous surveys have taken place within the APE and as part of those surveys eleven cultural sites were identified. Monitoring of the eleven previously identified sites took place when sites had the potential to be impacted by proposed treatments. Two of the previously identified sites have been determined ineligible for inclusion to the National Register of Historic Places (NRHP). The remaining eight sites have not been evaluated for their eligibility for listing on the NRHP. Therefore, the sites will be treated as eligible until a formal determination of eligibility can be made. The sites will be flagged for avoidance prior to commencement of the project.

Effects Analysis

Direct and Indirect Effects

Alternative 1 – No Action

No treatments of any type would occur under this alternative. There would be no change in current management direction or in the level of ongoing management activities.

Effects would derive from unmanaged fuels consumed during a wildfire event. By not treating the fuels, burn temperatures in many areas would likely be extreme, endangering cultural resource sites and artifacts. The analysis value of obsidian artifacts for chronology and sourcing information would be compromised by extreme temperatures. Metal artifacts would be further oxidized, becoming more brittle. Glass melts and fractures. Ceramic objects fracture and lose decorative elements from smoke and heat. Organic materials such as wood shell, bone, antler, horn, leather and fabric may be consumed by fire or altered by smoke.

The loss of surface litter from intense wildfire combined with increased hydrophobic soil conditions could lead to erosion due to runoff of surface water. Erosion across sites can remove artifacts or deposit sediment from slopes above. Increased trampling from deer and elk on thinner forest floors has also resulted from wildfires.

Alternative 2 and Alternative 3

Known eligible or potentially eligible heritage sites would be avoided and/or protected; therefore, no known heritages resources would be affected by this project. Because 60 percent of low probability areas for cultural resources were not surveyed as part of this project, mitigation measures are in

place that would be part of contract specification should any new cultural sites be discovered during project activities. In areas of the project not surveyed there is a possibility of inadvertent direct or indirect effects to unknown cultural resources by some of the proposed actions.

Mechanical harvesting of trees within the project area would include various types of machinery. Harvesters, Feller Bunchers and Skidders are the most common equipment used. Harvesters and Feller Bunchers operate in a similar manner with the only real difference being the length of the equipment arm. Both machines are often tracked but can have rubber tires. Both machines have a hydraulic arm with a device that grabs and cuts a tree which allows the machine to carry and stack the logs without the tree touching the ground. The impacts from Harvester and Feller Bunchers comes from off road travel where the tracked version can cause direct effects in the form of displacing, crushing, breaking, or otherwise affecting the integrity of site materials, especially while turning. The rubber tire variant can have significantly less impact but still has the potential for similar direct effects as tracked variants. Rubber tire variants also cause less damage to brush then tracked versions and can lead to less indirect effects in the form of post operations erosion. Yarders are used to move larger trees or piles of trees to landings. This involves grappling the tree or trees and dragging the trees. Yarders also have a cable attached that can be used to drag a tree or trees to a landing area. Yarders can cause a direct effect on a cultural resource site by gouging, displacing, crushing, breaking, or otherwise affecting the integrity of site materials.

Two types of machinery are used for mechanical shrub treatments (mowing). The first is a rubber tired tractor using a rotary mower for slopes under 20%. Steeper slopes require a light tracked machine with a front-mounted mow deck that provides greater stability. The weight rating for the equipment is low, between 4-5 pounds per square inch (psi), and has a limited potential to cause damage more typical of the heavier skidders, shearing machines, and biomass machinery. The one function of the mowing equipment that causes some churning, mixing, and displacement of soils is when the machinery makes a turn; the tighter the turn the greater the amount of disturbance. The only direct effect that could occur from mowing would be when the equipment turns around.

Slash disposal using burn piles directly effects the more “durable” artifacts (made of inorganic materials) as well as perishable artifacts (made from organic materials). Burn temperatures reached in slash piles (up to 800 degrees F) are much higher than those in a broadcast underburn in light fuels conditions (250 to 300 degrees F).

Underburning poses a potential effect where fuels are greater than 2.5 tons per acre, or classified as more than light fuels. Research on prescribed fire and obsidian indicates that hydration rind analysis results are not affected when temperatures are 149 degrees C (300 degrees F) or less. Obsidian sourcing analysis using trace elements does not appear to be affected at temperatures below 100 degrees C. Obsidian hydration rinds are obliterated at temperatures over 425 degrees C (797 degrees F). If underburning is kept to temperatures below 100 degrees C then a positive effect could take place since the reduced fuel load will mitigate intense wildfires that would have a negative effect on unknown cultural resources.

Fire line construction by hand poses a potential for direct effects on significant cultural resource sites from displacement, churning, mixing, and breakage of artifacts. Loss of artifact associations and context are examples of lost site integrity. Hand line construction is more limited in effect than using machinery, since it is generally a much smaller fuel break.

Road reconstruction, road maintenance, and temporary road development in or through a previously unknown cultural resource site would have a direct effect on site integrity with damage from crushing, breaking, mixing, displacing, compacting, and otherwise disturbing the context of the

artifacts. Road reconstruction effects may be limited to potential impacts from restoring drainage features when they are related to the out sloping or water barring needed in association with culverts as well as without culverts. Activities that occur within an established road prism, including applying surface treatments of any sort, watering and blading, or slope stabilization within the road prism would generally have a positive effect since the maintenance would reduce erosion and the possibility of a road blowout.

Temporary road development through an unknown site could have a direct effect on site integrity from crushing, breaking, mixing, displacing, compacting, and otherwise disturbing the unknown site's context.

Felling danger trees along travel routes and where units border roads may have a direct effect on cultural resource sites due to the potential use of equipment off of existing disturbed areas. The effects of machinery on site integrity would be similar to other proposed treatments using heavy equipment. Additionally, there may be a direct effect similar to that from skidding if the trees or portions thereof are dragged to the road.

Should any new cultural resource site be discovered during project implementation, there would likely be an effect because the site was not discovered in advance. An example of this could be a small site that had previously only been identified as an isolated find due to a limited number of artifacts (less than 10 items) observed at the time of initial discovery. Often, by the time that such a site is relocated, some physical damage has already occurred, since increased visibility through mechanical disturbances lead to discovery.

Mowing shrubs and underburning the resulting slash material would reduce fuel loads and positively affect cultural materials sensitive to high intensity fires. Underburning would also remove vegetation that currently obscures artifacts on the ground surface and increases surface visibility. Greater visibility that exposes sensitive materials affects site integrity, since these materials could become more vulnerable to looting and vandalism.

Cultural resource sites located on sloping ground below treatment units may experience erosion and run-off of surface water, melting snow, and heavy rains. While not a direct effect of harvest, fuels, or reforestation activities, a site located down slope and outside of a harvest unit may be affected by either erosion or the depositing of sediments from outside the site proper, or both

With the design criteria included written for this project, this Alternative 2 and Alternative 3 is consistent with those federal laws and guidelines for the protection of NRHP eligible sites.

Cumulative Effects – All Alternatives

There are no direct or indirect effects to heritage resources from any alternatives. There would be no cumulative effects from this project.